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Shigeru Kuroda*, Dept. of Mathematics and Information Sciences, Tokyo Metropolitan University, 1-1 Minami-Osawa, Hachioji, Tokyo 192-0397, Japan. *Wildness of polynomial automorphisms in three variables.*

It was a longstanding open question whether there exists a wild automorphism of the polynomial ring in three variables over a field of characteristic zero. This was settled in the affirmative by Shestakov-Umirbaev, who gave a criterion for deciding tameness and wildness of automorphisms. Later, the criterion was modified by us, and became more useful. In this talk, we give several applications of the Shestakov-Umirbaev theory and its modification. We discuss the following topics:

1. A necessary and sufficient condition for the wildness of $\exp(hD)$, where D is a triangular derivation and $h \in \ker D$.
2. Relation between tameness and triangularizability of locally nilpotent derivations.
3. Construction of “very wild” coordinates f (such that $\phi(f) = f$ implies ϕ is wild for every $\phi \neq \text{id}$).
4. Local slice construction and wild automorphisms (We give new families of rank three locally nilpotent derivations D , and show that $\exp(hD)$ is wild for each D and $0 \neq h \in \ker D$). (Received September 05, 2010)